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A PROCESS FOR THE ANALYSIS OF SOAP, BASED IN PART ON THAT OF MOFFIT.

By A Sienier, Jr.

I. *Substances to be Sought.*

Three essential constituents are found in all soaps, viz., a base, a fatty acid and water. Besides these, there is usually more or less glycerin, sometimes added intentionally, though generally due to imperfect separation; an excess of alkali and alkaline and earthy carbonates are commonly found, and sulphates and chlorides are of frequent occurrence. By the following method the fatty acids, save resin, are estimated together. The base is estimated as soda in the case of hard soaps, and as potash in that of soft. The water is determined by subtracting the weight of all the substances found from the gross weight (it should not exceed 20 or 30 per cent).

Recapitulating, the substances to be sought are

Alkali, combined and free,	Carbonate,
Fatty acids (their fusing point to be found),	Resin,
Glycerin,	Salts and coloring matter,
	Water.

II. *Process.*

a. Average the soap fairly, and weigh out three portions—ten grams, ten grams and forty grams.

b. Digest ten grams with alcohol (five or six ounces), heat over water bath, filter, wash the residue frequently with hot alcohol (the funnel being kept hot by apparatus for hot filtration). Treat residue as (1), and filtrate as (2).

(1). *Residue.* (Carbonates, other salts, coloring matter, &c.)

Dry in oven at 212° F. (Counterpoise filter) and weigh. Digest

with hot water on filter and test solution volumetrically by a graduated normal solution of oxalic acid. Every c. c. used will indicate ·053 grams of Na_2CO_3. Incidentally notice whether any precipitate of calcic oxalate occurs. Subtract the weight of sodic carbonate from the whole weight of residue insoluble in alcohol, and the remainder is the weight of *salts and foreign matter.* This can be further analyzed, if it is desired.

(2). *Filtrate.* (Alcoholic solution of soap and free alkali).

Pass through it a stream of carbonic acid gas, if precipitate forms continue, until precipitation ceases; filter; dissolve precipitate in water, and estimate with normal graduated solution of oxalic acid, as before. Every c. c. indicates ·031 grams of *free soda*, or ·047 of *free potash*, as the case may be. No precipitate indicates absence of free alkali.

The filtrate from the precipitate by carbonic acid, or, if no precipitate has occurred, then the alcoholic solution, after the addition of about one ounce of water, is evaporated on a water-bath until all the alcohol has escaped (a retort may be used, if it is desirable, to save the alcohol). To the aqueous solution is then added normal graduated solution of oxalic acid, until it is acid to litmus paper. Each c. c. required indicates ·031 grams *combined soda*, or ·047 grams of *combined potash.*

A little sulphuric acid is now added, to separate the fatty acids more rapidly. Ten grams of beeswax—previously melted to free it from water—is added, and the whole placed on a water-bath until the fatty acids have mixed, forming a stratum on the top of the liquid. The mixture is then set aside to cool, and the cake, or solidified stratum, removed, dried and weighed. Subtract weight of beeswax, and the remainder is the weight of *fatty acids and resin.*

c. (1.) Take forty grams, dissolve in water, add dilute H_2SO_4 until precipitation ceases, and set aside in a cool place (below 57° F). The fatty acids will rise to the top, when they may be dried and weighed.

(2.) Digest, with constant mixing, the fatty acids with a mixture of water, with nearly as much alcohol, until the subsident liquid (when the mixture has cooled and the fatty acids again solidified) ceases to be milky. Weigh fatty stratum again, and subtract from weight ob-

tained above, and the result is, approximately, the weight of resin in forty grams. Divide by four, and the quotient is the weight of *resin* (approximate).

(3). Find *fusing point of fatty acids.*

d. Take ten grams, dissolve in alcohol, add alcoholic solution of sulphuric acid until precipitation ceases, and filter. Add baric carbonate and filter again. Evaporate until the alcohol is all expelled, and weigh sweet residue as *glycerin.*

e. Add together the amount found of carbonate, salts and foreign matter, alkali (free), alkali (combined), fatty acids, resin, glycerin, and the difference between that sum and ten grams is the weight of water.

University of Michigan, June, 1874.

RHUS VENENATA, OR POISON SUMACH—DESCRIPTION AND PARTIAL ANALYSIS.

By Robert M. Cotton.

This is a low, smooth, branching shrub, growing from six to eighteen feet high, and always inhabiting swamps, especially tamarack swamps. Its leaves are compound, dotless, alternate, odd pinnate and stipulate, with from seven to thirteen obovate-oblong, entire leaflets. It is most widely known under the common name of poison sumach, though, in some localities, it is known as poison elder.

It is not necessary to give the details of *the analysis,* as Rochleder's process for the analysis of plants was quite closely followed. It is sufficient to say that an acid was obtained from the decoction, which remained after subjecting a quantity of the powdered leaves to distillation for several days. This acid crystallizes in congregated clusters of minute, transparent, triangular prisms; non-volatile and decomposed by a high temperature. The water solution of these crystals has a moderately sour taste, and reddens blue litmus quite distinctly. With neutral acetate of lead, it gives a white, flocculent precipitate; with chloride of barium, a white, granular precipitate, which is increased in amount by heat; with calcic hydrate a white precipitate is produced after standing a short time. A large number of other reagents were added, such as nitrate of silver, phosphate of magnesium, chloride of mercury, etc., without producing any precipitates.

It was at first supposed that this acid was the same which Gmelin speaks of in his Hand-Book (this being the only work where anything was found in any way touching upon this plant or genus) under the name of rhus-tannic acid, and said to be a constituent of the plants of this genus. But it is found that this acid has none of the properties characteristic of the astringent acids; it has not an astringent taste; does not precipitate gelatin nor iron. Owing to the small quantity of the leaves originally taken, and the small amount of time that could be devoted to the work, the examination could not be further continued.

If so desired, this acid can be obtained in any quantity by boiling the dry powdered leaves with water for some time, straining, expressing and filtering while hot; then boiling with and filtering through animal charcoal, precipitating with neutral acetate of lead, decomposing the precipitate with sulphuretted hydrogen gas, filtering out the sulphide of lead, then evaporating and crystallizing. The crystals can be purified by re-crystallization from water solution, if so desired. It is found by experiment that, in passing the decoction through animal charcoal, the charcoal retains all of the coloring matter with nearly all of the gum, but not taking up any recognizable quantity of the acid.

Other crystals were obtained from portion third of the decoction, after having filtered out the precipitate caused by alum and ammonia, by evaporating the filtrate and allowing it to crystallize. These crystals are deposited needle-shaped, and as long triangular prisms. In shape, they resemble the first-mentioned crystals of this acid, but are very much larger. They have a sharp, salty taste, and are neutral in reaction; are soluble in water, hydrochloric, nitric, sulphuric and acetic acids; very soluble in ether, insoluble in alcohol, unless added in very large quantities. The crystals suffer decomposition instead of sublimation, and when completely burned leave a small white ash. The possibility of this being a compound formed from any of the reagents added, or by their decomposition, was satisfactorily precluded by special examination for that purpose. It is supposed that this is an alkaline earth in combination with an organic acid, probably the same acid which was previously obtained separate, though the reactions of these two sets of crystals differ in a few instances.

University of Michigan, July 3, 1874.

HELIANTHEMUM CORYMBOSUM, MICHAUX.

By Frederick J. Kruell, G. P.

Condensed from an Inaugural Essay.

This plant is said to possess the same medicinal properties as the officinal *Helianthemum canadense*. For the following analysis the herb was collected in the latter part of June, in New Jersey, and after carefully drying it in the shade, it was found to have lost 52·5 per cent.

An infusion, made with boiling water, was of a reddish brown color, and a slightly bitter but very astringent taste, and possessed a grass-like odor.

The infusion was free from starch; alcohol produced a precipitate, consisting mainly of gum, and iron salts indicated the presence of much tannin. The latter was removed by gelatin and the filtrate treated with subacetate of lead. The filtrate from this precipitate, after the removal of the excess of lead by sulphuretted hydrogen, contained but a minute quantity of coloring matter, which was found to be insoluble in alcohol and ether.

Three tinctures were next prepared with ether, alcohol and with diluted alcohol. Evaporated to the consistency of a solid extract, the diluted alcohol tincture yielded 28 per cent.; the alcoholic, 16·4 per cent., and the etherial 4·6 per cent. of the original weight of the herb employed; the portions of the herb extracted with alcohol and ether were dried, and exhausted with cold water, which, upon evaporation, yielded extracts weighing respectively 19·6 and 22 per cent. of the original weight, and containing glucose as indicated by Trommer's test.

The extract obtained with diluted alcohol was of a dark-brown color, and a bitter and astringent taste; it was exhausted with diluted muriatic acid, the tannin removed, and then treated with carbonate of sodium, which darkened the color without producing a precipitate, evaporated to an extract and treated with alcohol, which dissolved a little coloring matter but no alkaloid.

The residue left by the dilute acid was digested in hot alcohol, and the solution filtered: this was of a dark-brown color and a slightly bitter taste; when added to water, it produced a milky solution, and, on further examination, was found to be resin and coloring matter.

The alcoholic tincture yielded an extract which was of a dark-green

color, and a bitter and astringent taste; was but slightly soluble in water, ether and chloroform, imparting merely a light-green color to the latter solutions. It consisted of resin, chlorophyll, bitter extractive and coloring matter.

The extract obtained from the etherial tincture was of a dark-green color, and of an agreeable aromatic odor, but of exceedingly disagreeable taste, resembling somewhat that of coal oil. This extract was insoluble in water, but readily soluble in alcohol and bisulphide carbon, and sparingly so in chloroform. It consisted mainly of chlorophyll, waxy matter and an acrid resin.

A portion of the herb was distilled with water, but no indications of a volatile oil were obtained.

From the foregoing experiments I would infer that the medicinal properties of frostwort are due to tannin and extractive matter.

The constituents of frostwort may be briefly summed up as follows: *Tannin*, of which it contains a large percentage, resin, glucose, gum, extractive matter, chlorophyll and inorganic salts.

EMULSIONIZING HOFFMANN'S ANODYNE.

Editor American Journal of Pharmacy:

A few days ago, I received the following prescription:

Hoffmann's anodyne,	℥ii,
Acaciæ pulv.,	
Sacchar. alb.,	*aa* ʒii,
Aquæ,	℥i.

Never before having had to make a similar mixture, I had my doubts about its feasibility; at any rate, I would try. The old mortar process having failed (not to mention that no inconsiderable part of the anodyne volatilizes before the mixing can be done), I tried the bottle process of Mr. Forbes (*Am. Journ. Pharm.*, 1872, p. 61). For some reason or other, I did not succeed, probably for want of dexterity. Mr. Forbes' process is first to put the liquid to be emulsionized in the bottle, then a small quantity of powdered gum, shaking well, and then water.

At last I hit upon the following:

I put in the bottle—

Mucilag. acac. (U. S. P.).	fʒii,
Water,	fʒvi,
Hoffmann's anodyne.	f℥ii,

and agitated violently; a milky mixture, without any separation of gum, resulted. At last I added the sugar, ʒii. Instead of the prescribed ʒii acacia, I took only 48 grains.

You will see that I only followed the old, very old rule, for making emulsions. Make the mucilage of about "the same consistence as the liquid to be emulsionized."

By the way, I see that Mr. Forbes' plan has been suggested not only by M. Nougaret, for castor oil (*Am. Journ. Pharm.*, 1869, Vol. xli, p. 204), but that Mr. Thos. Powers speaks of this bottle process as of an old one (*Am. Journ. Pharm.*, 1833, Vol. v, page 101). But Mr. Forbes is the first who found out how very little gum is needed to make an emulsion.

HANS M. WILDER.

Philadelphia, July 6th, 1874.

FLUID EXTRACT AND SYRUP OF AZEDARACH.

By JOHN JOSEPH MILES, G. P.

Extract from an Inaugural Essay.

Melia Azedarach, an elegant tree, twenty-five to thirty-five feet in height, is the principal shade-tree in the avenues of many of our Southern villages and cities, where it is known under the names of Bead-tree, Pride of China, China-tree, Pride of India, &c. It is avoided by flies and other insects.* The bark of the root is officinal in the U. S. Pharmacopœia, but all parts of the tree possess medicinal properties; it acts as an anthelmintic, and in large doses, narcotic.

The fluid extract is prepared as follows: Take of the inner bark of the root sixteen troyounces; dilute alcohol, sufficient quantity. Macerate the bark in sixteen fluidounces of the dilute alcohol for twenty-four hours; then percolate until twelve fluidounces have been obtained, and set this aside. Continue the percolation with sufficient dilute alcohol to obtain twelve fluidounces of percolate; evaporate

* Dr. F. P. Porcher, in his "Resources of the Southern Fields and Forests," states that a decoction of half a bushel of berries to fifteen gallons of water sprinkled over the affected plant, will, in most cases, prevent the depredation of the black grub or cutworm; and, upon the authority of Mr. John Commins, it is asserted that the Pride of India, by being planted alternately with peach-trees, will prevent the latter from being infested by the aphis, and protect the fruit of the peach against the immense destruction by insects.—EDITOR AMER. JOURN. PHARM.

this to two fluidounces and add to the reserved portion. Filter, add six troyounces of white sugar, and dissolve by aid of a gentle heat.

The above extract has been used with satisfaction and decided results in the dose of one-half to one teaspoonful, according to age.

A very agreeable syrup may be prepared from the extract by the following formula: Take of fluid extract four fluidounces; syrup of vanilla, eight ounces; simple syrup, sufficient to make one pint. This is used in the dose of three to four teaspoonfuls. The syrup of vanilla wholly disguises that bitter and disagreeable taste that is so objectionable in most of the anthelmintics.

GLEANINGS FROM THE EUROPEAN JOURNALS.

By the Editor.

The Powdering of Chlorates is usually effected in a mortar, the salt being kept moist by alcohol. To obtain larger quantities of chlorate, in the form of powder, suitable for colored fires, A. Gawalowski proposes to dissolve the chlorate in hot water, to complete saturation, and to dip into the solution plates of glass, which, on being removed, become covered with a fine crystalline powder of the salt, which is readily collected upon paper and dried, without the least danger to the operator.—*Pharm. Cent. Halle, No.* 24, from *Journ. f. pr. Chem.*

Alkaloid in Hops.—In 1863, Lermer suggested the presence of a peculiar alkaloid in hops. Griessmayer's recent experiments seem to prove the existence of a peculiar volatile alkaloid, which he named lupulina. The concentrated aqueous decoction of ten pounds of hops was distilled with potassa or with magnesia, the distillate neutralized with muriatic acid, evaporated to dryness, treated with cold absolute alcohol, to remove sal ammoniac, the alcoholic liquid heated to boiling and cooled, when much muriate of trimethylamina crystallized. The filtrate was evaporated in a water-bath, and finally spontaneously, the residue redissolved in water, in a narrow cylinder, agitated with potassa and ether, and the ethereal solution evaporated spontaneously. The remaining alkaline liquid had a peculiar odor, reminding of conia, and a cooling, but not bitter taste. It soon separated small crystals, and finally solidified completely. The author supposes that these crystals are impurities, and that the pure alkaloid is liquid

or gaseous. The following reactions were obtained with the alkaline residue:

Chloride of platinum produces, after the addition of alcohol and ether, a green-yellow precipitate. H_2SO_4 and bichromate of potassium causes a violet coloration. Fuming HNO_3 yields at first a yellow color, which turns green, then dark-green, and finally colorless. White precipitates are obtained with tannin, silver nitrate, Fehling's solution and corrosive sublimate; with chloride of gold a yellowish-white precipitate, soluble in HCl; with iodine a brown precipitate; with bromine, sulphur-yellow, becoming orange and brown; with phospho-tungstic acid, voluminous yellowish-white. Nessler's reagent gave the reaction of ammonia; chlorine had no effect; with sulphuric, muriatic and oxalic acids, no crystalline compounds were obtained. —*Chem. Cent. Blatt., No.* 21; *Polyt. Journ.*, ccxii, 67.

Pure Albumen.—Graham's statement, that by dialysis for three or four days an albumen may be obtained which, on incineration, leaves no trace of ashes, has been examined by B. Aronstein, and found to be correct. It is necessary, however, to use very fine parchment paper, made by De la Rue, of London, no German parchment paper giving satisfactory results. The author's conclusions are as follows:

1. Pure albumen is completely soluble in water; its solution in the animal liquids is not affected by either the soluble or insoluble salts.

2. Pure albumen is neither coagulated by heat, nor by alcohol; in both cases coagulation depends upon the presence of salts in its natural solutions.

3. The insoluble salts, dissolved in the animal liquids, form no compound with albumen; their solution in the blood serum, as well as in the whites of eggs, is effected by an organic body which does not belong to the albuminous compounds.

4. The two liquids mentioned contain, besides albumen, paraglobulin, which albuminous body is insoluble in water, but here dissolved by the salts.

5. Pure serum albumen is precipitated by ether, but not pure egg albumen; in the presence of salts the action of ether is reversed.—*Zeitsch. f. Anal. Chem.*, 1874, 71; *Arch. f. Physiol.*, viii, 75.

Detection of Morphia in the Presence of Quinia.—L. W. Jassoy proposes to agitate the supposed mixture with twenty times its weight

of water, and filter. If the quinia was present as sulphate, the greater portion of it will remain undissolved, while the morphia salt will be found in the filtrate, to which a few drops of iodic acid are added, and after agitation a little chloroform; the latter will dissolve the liberated iodine, or, in case morphia is not present, will remain colorless, while the filtrate becomes fluorescent.

In the presence of the more soluble muriate of quinia, the reaction is a little different. After proceeding as stated above, a yellow coloration will at once be produced if morphia be present; but the iodine will not be dissolved in the chloroform, unless an excess of morphia be contained in the mixture. The yellow color, however, produced by the formation of a compound insoluble in chloroform, between the liberated iodine and the quinia, is sufficient to indicate the presence of morphia, or of a foreign body with a similar behavior towards iodic acid.—*Arch. d. Pharm.*, 1874, *June*, 517.

The Rapid Evaporation of Ethereal Tinctures from narrow vessels is effected by the following simple contrivance of Dr. G. Vulpius. The ethereal tincture is introduced into a beaker or cylinder, and a glass syphon is arranged in such a manner that the short leg is suspended at a distance of not over one centimeter above the surface of the ethereal liquid, while the long leg may reach nearly to the floor. Slight suction at the latter aperture will cause the heavy ether vapor to be siphoned off from above the liquid, and the evaporation of the ether and removal of its vapor continues so rapidly, that at the summer temperature the ether will run off in drops if the long leg be surrounded by a layer of moist paper. The short siphon leg should be lowered in proportion as the ethereal liquid evaporates.—*Ibid.*, *p.* 522.

Dry Syrup of Almonds.—To avoid the inconveniences resulting from the separation and rapid decomposition of almond syrup, Dr. Enders suggests a dry preparation from which the syrup may be very easily obtained. Twenty parts of sweet almonds are made into an emulsion with sufficient distilled water; the emulsion is mixed with seventy-two parts of sugar, and in a steam-bath rapidly evaporated to dryness; the residue is powdered and kept in well corked vials. To prepare one hundred parts of syrup, sixty-eight parts of this powder are dissolved in twenty-four parts of water by the aid of heat, and then five parts of orange-flower water and three parts of bitter almond water are added.—*Ibid.*, *p.* 511.

THE REACTIONS OF ACIDS WITH OIL OF PEPPERMINT, AND THEIR BEARING ON THE FORMATION OF CHLOROPHYLL.*

By M. A. Frebault.

With the object of combining the hydrocarbon of oil of peppermint with picric acid, the author heated gently together an alcoholic solution of that acid with some of the essential oil; water was added to dissolve the excess of acid, and the mixture left to stand. Twenty-four hours afterwards the oil, which had collected at the surface of the liquid, presented a magnificent green color. This formed the starting point for the author's investigation.

Action of Picric Acid upon Oil of Peppermint.—If oil of peppermint be agitated with picric acid, nothing is observed at first further than that the picric acid partially dissolves, and communicates its yellow color to the oil; but in half an hour the mixture is colored manifestly green, and in twenty-four hours this coloration acquires a great intensity. If a slight heat be applied to the mixture the green color appears more rapidly.

This green product, exposed to the air upon water during four or five days, acquires the reddish-yellow color of dead leaves. Introduced floating on water into a test-tube containing nitrogen, the color is retained for some time; but in oxygen it disappears more quickly. Treated several times with cold water, the washings remove each time some of the picric acid together with a red coloring matter, and finally the essential oil remains of a reddish-yellow color.

The green product has a strong red fluorescence, and in an alcoholic or ethereal solution, this phenomenon is still more marked. Treated with solution of caustic potash or ammonia, a picrate of the base employed is formed, and the essential oil remains of a reddish-yellow color. When the green product is distilled from caustic potash, a colorless liquid passes over into the receiver, and there remains in the retort a black mass analogous to that obtained by treating oil of peppermint with chromate of potash. The distillate no longer yields the green reaction with picric acid. Nascent hydrogen reduces the green product, and transforms it into a brown substance. If, instead of operating in the cold or with a gentle heat, the solution of picric acid in oil of peppermint is boiled for a few moments, it passes from the green state to yellow-brown, and then reddish-brown. Upon the

* Abstract of a paper in the *Répertoire de Pharmacie*, vol. ii, p. 199.

addition of ammonia it quickly forms red crystals, which are probably picramate of ammonia, and some crystals of picrate, whilst in the midst of them is disseminated an amorphous powder of a beautiful red color. This red powder is soluble in water, insoluble in benzin and oil of turpentine, and very slightly soluble in ether and alcohol.

That oil of peppermint is a reducing agent is shown by its producing the characteristic color of Prussian blue in paper saturated with a solution of ferric sulphate and ferricyanide of potassium. At the boiling temperature it partially transforms the perchloride of iron to the state of protochloride, and the perchloride of mercury is also partially reduced to calomel. Submitted to dialysis in alcoholic solution, the picric acid diffuses through from the green product, together, no doubt, with a little menthene, the solid and crystallizable portion of the essential oil. This solution has a bitter, sweetish, and slightly cool taste. Distilled in a water-bath it leaves a yellow residue, which, treated with sulphuretted hydrogen and ammonia, gives the intensely red coloration of picramate of ammonia. The alcoholic distillate has the cool taste of oil of peppermint due to the menthene.

It was thought interesting to investigate whether the reaction took place between the crystallizable portion or the hydrocarbide of the essential oil and the picric acid; whether the green reaction was also produced with oil of pennyroyal, which contains no stearopten. The phenomenon of coloration was found to be limited to the oil of peppermint, except that it occurred also with oil of chamomile; but in that case there is no combination, the green being produced by the mixture of blue and yellow, and there is no red fluorescence.

The reaction between oil of peppermint and picric acid is so clear, that the author thought that picric acid might be used in testing for the presence of that essence in a mixture of essential oils, and *vice versâ* that oil of peppermint would be a suitable test for the presence of picric acid. For this purpose he made a mixture of several essences, about two grams, to which he added two drops of oil of peppermint. This was shaken with a solution of ten centigrams of picric acid in about fifty grams of water. At the end of twenty-four hours the essential oils collected on the surface, and presented a very perceptible green tint. In a second experiment, a decoction of barley and hops was made, to which an extremely small quantity of picric acid was added. The

liquor was filtered, and a portion of it agitated with fifty centigrams of oil of peppermint in a test-tube. The green color was very evident after twenty-four hours.

The author has made no experiments with beer, but he suggests that it might be tested by evaporating the suspected beer to the consistence of honey, treating the extract with alcohol to which a few drops of nitric acid have been added, filtering the liquid, concentrating and agitating with a little oil of peppermint. Nitric acid is used for the purpose of oxidizing any acid that may have been reduced to picramic acid by the action of sugar in the beer, and to saturate the lime salts present.

Action of other Acids on Oil of Peppermint.—The question as to what this coloration is due may receive some elucidation from observation of the action of other acids upon oil of peppermint, which has not yet been carefully studied. The following are the principal effects noted by the author:—

Sulphuric Acid produced at first a rose color, then reddish-yellow, passing rapidly to reddish-brown. When ether was added it acquired a beautiful yellow color, whilst the lower portion of the mixture was colored red. When water was added and the mixture shaken the liquid separated into two layers, of which the lower acid aqueous layer was rose-colored, and the uppermost ethereal layer took a greenish-blue tint and had a strong red fluorescence.

Hydrochloric acid induced a rose color rather slowly. Upon the addition of ether this became faintly green. When water was added the underneath layer was rose-colored, but the ether retained its green color. In some experiments a blue color was produced.

Nitric acid caused first a rose coloration, then red, soon becoming greenish. Upon adding ether and water and shaking, the underneath layer was rose, and the ether rising to the top took a violet-blue grey color.

The blue and green tints were rapidly altered by the action of air and light.

These observations were made upon pure and quite colorless oil of peppermint. When the yellow or greenish-yellow tinted oils frequently met with in commerce were employed, the phenomena of coloration were much more intense with sulphuric and hydrochloric acids; whilst with nitric acid the ethereal layer acquired a magnificent green

color and a strong red fluorescence. The rose coloration first produced by the acids had a violet reflection. Moreover, when chloroform was employed in the place of ether, sometimes a violet or a grey color was obtained, the latter being the result of a mixture of yellow and violet, or perhaps red and green, or even blue and orange.

From the foregoing, the author concludes that the coloration produced by picric acid when reacting upon the oil of peppermint is not a property peculiar to itself, but common to the strong acids; that the picrate of the hydrocarbide which he sought was not produced; that it was not a case of oxidation *pur et simple* as might have been supposed with picric acid. He looks upon the coloration as a phenomenon dependent upon the separation and combination of the coloring matters contained in the oil of peppermint. He thinks that the acids split up the oil into five coloring principles, red, blue, green, yellow and violet; and that, according to the quantity and nature of the acid employed, one or other of these principles is obtained, or perhaps a grey resulting from a mixture of two complimentary colors.

Relation of the Green Coloring Matter to Chlorophyll.—The author remarks upon the striking analogy which appears to exist between the green substance obtained by the action of acids upon oil of peppermint and chlorophyll, which is set forth in the following table:—

Chlorophyll.	Green Matter obtained by the Action of Acids on Oil of Peppermint.
Strong red fluorescence.	Strong red fluorescence.
Becomes reddish-yellow in the air (dead leaves).	Exposed to air, it is changed into a reddish-yellow substance.
Treated with alkalies it becomes yellow.	Treated by alkalies, it becomes yellow.
Reduced and decolorized by nascent hydrogen.	Reduced and transformed into a brown matter by nascent hydrogen.
Yellow leaves become green by the action of acids.	After being made yellow by alkalies, again becomes green when treated with acids.
The green and blue colors obtained by the action of acids on chlorophyll are decomposed by light.	The green and blue colors obtained by the action of acids upon oil of peppermint are decomposed by light.

This comparative table presents points of great resemblance, of

which the most important doubtless is the fluorescence, the red fluorescence being characteristic and confined to these two substances. Supposing it probable that in both cases the appearance is due to chlorophyll, the author endeavors to explain its formation in the oil of peppermint. He considers that as his experiments were made with colorless oil of peppermint it is necessary to assume that the constituent elements of chlorophyll exist in that essence; but probably they exist there in a state of reduction, and that it is only under the influence of acids that a kind of synthesis of the chromule takes place. The blue principle (Frémy's phyllocyanin) and the yellow principle (phylloxanthin) are, so to speak, in a latent and colorless state, either in consequence of reduction or their combination with the other coloring principles present in the oil. Under the influence of acids the phyllocyanin is regenerated, and at the same time the phylloxanthin, separated from the red and violet principles, unites with the blue especially to form the green color. With picric acid and nitric acid the green coloration is more intense than with the other acids, because an oxidizing action is combined with a separative action.

According to this hypothesis, which the author proposes to test by further experiment, chlorophyll, or at least its constituents, are volatilizable in the state in which it actually exists in oil of peppermint. The greenish color which is seen in the oil when imperfectly rectified wouldt hen be due probably to chlorophyll, of which the elements have not been completely altered in a first distillation.

Action of Chloral upon Oil af Peppermint.—The rose coloration which takes place when hydrate of chloral is shaken with oil of peppermint, which was pointed out by M. Carl Jehn,* has also been the subject of experiment by the author. He has come to the conclusion that the color is produced in the oil of peppermint and not in the chloral hydrate, and that it only occurs when the chloral hydrate used is acid, it being more intense in proportion as the chloral hydrate is more acid. But he has not yet been able to experiment with perfectly neutral specimens. In this case the reaction would be due to the formic acid contained in the chloral hydrate, or possibly to hydrochloric acid resulting from partial decomposition.—*Pharm. Journ. and Trans.*, *June* 6, 1874.

*See Pharmaceutical Journal, before, p. 556; Amer. Jour. of Phar., 1873, p. 447; compare also Amer. Jour. Phar., 1874, p. 273.

SOLUBLE STARCH.*

By M. Musculus.

Chemists are not in accord as to what is to be understood by "soluble starch." Some consider as such the matter colored blue by iodine, which can be removed from starch by means of water, and which Naegeli has called "granulose." Others think that the substance colored violet by iodine, which Béchamp obtained by treating starch with sulphuric acid, to be the true soluble starch. But the author has found that granulose, although it passes readily through a filter, is not really soluble in water, for it can be separated by evaporation in a state completely insoluble even in boiling water. Also that the soluble starch of Béchamp is a mixture in which may be found granulose, soluble starch, and the products of decomposition of starch (dextrin, glucose, or glucosin), which are always formed with sulphuric acid.

The author has previously made known under the name of "*dextrine globulisée*,"† a body insoluble in cold water, which he obtained by dissolving starch in boiling acidulated water, and evaporating after saturation of the acid and filtration, to the consistence of a syrup. This deposits an abundance of granules, insoluble in cold water and soluble only at 50° C., a property that allows of their being washed and separated from the dextrin and glucose by which they are accompanied; further treatment with alcohol with remove a little granulose still adhering, and there will then be left what the author considers to be true soluble starch; the granules composing it being grains of starch deprived of their organization.

The author enumerates the following properties of this product to substantiate his assertion. When dried in the air it is white and resembles starch. Freshly washed, it is insoluble in cold water and does not reduce salts of copper; but if it be left for some time in contact with water, it dissolves perceptibly and there is at the same time a little sugar formed. Its rotatory power is nearly quadruple that of dehydrated glucose. It dissolves entirely in water at 50° C., and is not precipitated upon cooling; by evaporation, however, a residue is obtained which has recovered its insolubility in cold water. To redis-

† Abstract of a paper read before the French Academy (*Comptes Rendus*, vol. lxxviii, p. 1413).

* *Comptes Rendus*, vol. lxv, p. 857.

solve it, it is necessary to heat it to boiling, or allow it to digest for half an hour in a water-bath at 100° C. Alcohol precipitates it and also restores it to its insoluble state. The same result is obtained by congealing the solution in a freezing mixture, it being found when the ice is melted as a white precipitate at the bottom of the vessel. When this substance is mixed with dextrin and glucose, as in the mother liquor wherein these granules are formed, all these properties disappear.

These artificial starch granules give with iodine all the color reactions obtained with the natural granules as well as those given by dextrin, according to the disposition of their molecules, the result being variable at will. Thus, a dilute solution takes a pure red color; but when it is concentrated to saturation, iodine gives rise to a violet color. If iodine be added to a solution moderately diluted, so as to produce a deep red-brown color, and the solution be allowed to evaporate in the open air, it will gradually grow more and more purple; and eventually, when sufficiently concentrated, become of a magnificent pure blue color. If water be added, the violet color reappears and in its turn gives place to a pure red.

If, instead of concentrating the red liquid by evaporation, a neutral salt having an affinity for water, such as chloride of calcium, be added, the result is the same. If the blue solution be allowed to stand for twenty-four hours, it deposits a blue-black substance, which is not dissolved by cold water. This precipitate, however, appears to dissolve in water; it does not affect its transparency, and passes readily through a filter, but after a very short time it is again deposited. This is characteristic also of the iodized granulose; from which the author concludes that in both bodies the disposition of the molecules is the same, and that they do not differ in degree of cohesion.

The iodized artificial granulose can, in fact, be destroyed, by a slight elevation of temperature; it enters into solution in the water in which it was suspended, and is then only colored red with iodine, whilst natural granulose resists a boiling temperature and continues to be colored blue with iodine. The artificial granules resemble also natural grains of starch, in not being colored by a small quantity of iodine, the blue only appearing when it is in excess; but if they be triturated in a mortar with a small quantity of iodine, a mass of a pure blue color is produced.

When starch is incompletely dissolved, either with diastase or boiling acetic acid, the fragments which resist the longest are no longer colored blue with iodine, but take a tint which varies from yellow to orange-red. The artificial granules give the same colors if their cohesion be augmented, which may be done by dissolving in water and evaporating to dryness.

Diastase decomposes soluble starch in the same manner as natural starch, but much more easily and completely. According to the observations of Payen, Schwarzer, Schulze, and the author, when diastase is caused to act upon starch, all coloration with iodine disappears when the degree of saccharification reaches one-fourth; then, by augmenting the diastase, the saccharification may be increased to one-half, a point that is not passed to any sensible extent; in fact, by his earlier experiments, the author was led to think that it was not possible to saccharify more than one-third of a given quantity of starch by means of diastase. With soluble starch, however, the stoppage of the saccharification at one-third does not occur. The reaction with iodine disappears when it reaches one-fourth; then, if more diastase be added, the production of sugar goes on rapidly until it reaches one-half, when it ceases, as with natural starch.

A widely diffused opinion, introduced into science by Naegeli, regards starch as essentially composed of cellulose mixed with a little granulose. Béchamp has found that dextrin obtained from cellulose has less rotatory power than dextrin from starch. The author prepared dextrin from cellulose by dissolving cotton in strong sulphuric acid. This dextrin was afterwards saccharified with boiling acidulated water, and it was found that during this transformation the rotatory power was not changed. Starch, treated in the same manner, yielded, on the contrary, a dextrin of which the rotatory power had been lowered more than one-half by the saccharification. It follows that the dextrin from cellulose has the same rotatory power as the sugar which is derived from it, which is not the case with that from starch. The author further remarks that all the dextrins of starch sugar have a rotatory power at least double that of the sugar itself.

It is known that glucose freshly dissolved, and especially dehydrated glucose, has a rotatory power at least double that of glucose that has been some time dissolved in a small quantity of water; but this property is not persistent. The author has prepared a dextrin from glucose, by treating that sugar with concentrated sulphuric acid

and then with 95° alcohol. This anhydride has also a rotatory power double that of the glucose, and this power is persistent.

The author has not yet obtained sugar from cellulose sufficiently pure to be able to compare it with sugar from starch; but he feels certain that there is no great difference between their rotatory powers; so that their isomerism would not be manifested so clearly as in their dextrins.

The author proposes to investigate whether other sugars which are regarded as identical with glucose—the glucoses of honey and of fruits, diabetic sugar, &c.—present the same kind of isomerism.—*Pharm. Journ.* [*Lond.*], *July* 4, 1874.

NOTE ON THE SOLUBILITY OF PLUMBIC CHLORIDE IN GLYCERIN.

By Charles H. Piesse, Public Analyst for the Strand District.

Although it has been noticed that plumbic chloride, and some other metallic chlorides, are somewhat soluble in glycerin, I have not been able to learn that any determinations of the extent of their solubilities have been made. I venture to think therefore that the following quantitative experiments upon the solubility of plumbic chloride in glycerin may be worthy of note.

The experiments were divided into two classes; firstly of the solubility of plumbic chloride in pure glycerin; and secondly of its solubility in mixtures of glycerin and water.

For the first, pure glycerin of commerce was dried in a water-oven, until it ceased to lose weight; about 100 c.c. of it was then rapidly poured into a dry bottle capable of holding about 150 c.c., and some dry $PbCl_2$ in impalpable powder added; the bottle then corked, and hermetically sealed, was agitated for a couple of days, being placed in the water-oven during the intervals, so as to maintain the temperature at about 100°C. The glycerin was then filtered in the water-oven, the funnel having been previously heated therein, the filtrate being collected in a weighed dish. When a quantity equal to about 300 grains had filtered, the dish was removed, allowed to cool in a desiccator, and then rapidly weighed, a precaution which the very hygroscopic character of glycerin renders imperative. The weighed filtrate having been washed into a beaker, some dilute sulphuric acid was added, the precipitated plumbic sulphate being collected and

weighed with the usual precautions. The following were the results of two determinations:

	Used.	$PbSO_4$ found.	Solubility of $PbCl_2$ in 100 of $C_3H_8O_3$.	Average.
I . . .	274·59	6 07	2·01	1·995
II. . .	385·85	8·18	1·97	

The solubility of the plumbic chloride appears not to be perceptibly increased by the temperature at which the experiments were performed, since after several days standing in the cold (always in a desiccator), only the slightest possible opalescence was noticeable; the advantages gained by heating being the diminished viscidity of the glycerin, and the prevention of the absorption of moisture.

For the second, weighed quantities of dry glycerin were mixed with weighed quantities of distilled water in specific proportions. The bottles containing the mixtures, with an excess of plumbic chloride, were intermittently shaken for about a week; these experiments being conducted at the ordinary temperature. The results show that the solubility of the plumbic chloride is in direct ratio to the proportions of the glycerin and water. Thus:—

Mixture A. $C_3H_8O_3$, 50 per cent. + H_2O, 50 per cent.

	Used.	$PbSO_4$ found.	Solubility per cent.	
I . . .	371·60	5·55	1·37	Theory, 1·363.
II. . .	389·48	5·35	1·26	Practice average, 1·32.

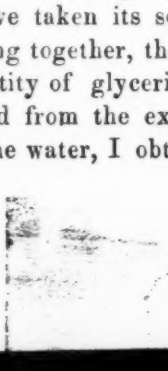
Mixture B. $C_3H_8O_3$, 25 per cent. + H_2O, 75 per cent.

	Used.	$PbSO_4$ found.	Solubility per cent.	
I . . .	307·88	3·39	1·01	Theory, 1·044.
II. . .	418·43	4·87	1·06	Practice average, 1·036.

Mixture C. $C_3H_8O_3$, 12·5 per cent. + H_2O, 87·5 per cent.

Used.	$PbSO_4$ found.	Solubility per cent.	
453·39	4·43	0·91	Theory, 0·889. Practice, 0·91.

In calculating the solubility of plumbic chloride in these mixtures, I have taken its solubility in pure water to be 0·733 per cent. By adding together, the weight of the plumbic chloride dissolved by the quantity of glycerin present in 100 parts of the mixture (as determined from the experiments with pure glycerin), and that dissolved by the water, I obtained the theoretical amount which the mixture



was capable of dissolving. These approximate so closely to practical results, that they seem to prove the accuracy of the determinations of the solubility in pure glycerin. In order to see that the whole of the lead was precipitated from these mixtures by sulphuric acid, the filtrates from them were neutralized with ammonia, and then treated with sulphuretted hydrogen, without causing more than the slightest discoloration.—*Jour. Chem. Soc.*, (*London*), *June*, 1874.

NOTE ON A REACTION OF GALLIC ACID.

By Henry R. Procter, F.C.S.

If a solution of sodic or potassic arsenate, of faintly alkaline reaction, be added to one containing gallic acid, and the mixture exposed to the air, it will rapidly absorb oxygen, and develop an intense green color. If the liquid be undisturbed, the change will commence at the surface, and a beautiful green layer will be formed, floating on the colorless liquid; while if air be altogether excluded, no apparent change takes place. 0·05 mgr. of gallic acid will produce a decided coloration in 1 c.c. of water. The arsenical solution must not be acid, but excess of alkali causes irregular oxidation and the formation of brown products.

Dilute acids change the green to a clear purplish-red, and cautious neutralization with alkalis restores the green, but any considerable excess of the latter destroys the color. In its reactions with acids and alkalis it shows a certain similarity to the coloring matter of red cabbage, but in most other reactions the two are completely dissimilar. There is also a considerable difference in their absorption-spectra, the cabbage-green transmitting a broad band of red, while the gallic-green does not.

Concentrated nitric and sulphuric, and boiling hydrochloric acids change the color to a pale yellow, which is not restored by Ammonia, but, in the case of nitric acid, is changed to a deep orange-brown.

Oxidizing agents mostly change the color to an orange-brown. Even iodine in potassic iodide does this immediately.

The color is also destroyed by reducing agents. *Sulphuretted hydrogen* passed into the acid solution rapidly decolorizes it, with no immediate precipitation of arsenic sulphide, and but slight deposition of sulphur. *Ammonic* and *sodic sulphides* instantly change the

color to brown or orange. *Sulphurous acid* and *ammonic sulphite* destroy the color in either acid or alkaline solution.

Sodic hyposulphite does not completely destroy the green, but makes it paler, and on the addition of hydrochloric acid a pale bluish green remains, which is unaltered by excess of acid, but gradually fades away.

Nascent hydrogen from zinc or sodium amalgam rapidly decolorizes the acid solution, but only acts very slowly on the alkaline one. No arsenetted hydrogen is evolved. The green matter is not taken up from its aqueous solution by ether, bisulphide of carbon, benzene, or anilin, but is partly precipitated by alcohol.

When gallic acid is present in excess, a green solution is sometimes formed, which is not reddened by acids, but only turned purplish, and which on standing deposits a bluish precipitate.

The reaction seems peculiar to gallic acid. Gallotannic acid slowly gives a faint greenish tint, probably due to traces of gallic acid, while pyrogallin not only does not give the reaction, but seems to interfere with it when gallic acid is present.—*Jour. Chem. Soc.* (*London*), *June*, 1874.

IODIDE OF BISMUTH AND POTASSIUM AS A TEST FOR ALKALOIDS.*

By M. Yvon.

The employment of the double iodide of bismuth and potassium has been indicated for the detection of alkaloids, but the value of this new reagent has not yet been sufficiently established. The author, in a note read recently before the Société d'Emulation pour les Sciences Pharmaceutiques, describes a method for its ready preparation.

The preparation of the reagent by means of iodide of bismuth, obtained according to either of the processes given in Wurtz's Dictionary, and iodide of potassium, appears to present some difficulties, the iodide of bismuth not being entirely soluble in the alkaline iodide. But it is not at all necessary to use the iodide of bismuth, and the

* Répertoire de Pharmacie, vol. ii, p. 335.

author gives the details of several alternative processes, but for various reasons adopts the following as the most convenient:

Take of—

Subnitrate of Bismuth	1·50 grams.
Iodide of Potassium	7·00 "
Hydrochloric Acid	20 drops.
Water	20 grams.

The subnitrate is suspended in water and boiled, and the alkaline iodide and the acid are then added. A limpid solution is thus obtained of very fine orange-yellow color, which may be readily used as a test for alkaloids.

If one drop of this solution be poured into water, a white precipitate is produced, resulting from the decomposition of the salt by the water. This decomposition may be avoided by the addition of a few drops of an acid, the author preferring hydrochloric acid for the purpose. It is not indifferent whether the acid be added to the reagent or to the solution to be tested for an alkaloid; four drops of hydrochloric added to 40 or 50 c.c. of the latter being sufficient to prevent the decomposition, but a much larger quantity is required if added to the iodide reagent.

If the solution be not sufficiently acid, the decomposition takes place after some minutes, instead of occurring immediately. But the more or less deep orange-yellow precipitate resulting from the presence of an alkaloid may be confounded with the pale yellow product of the decomposition of the iodide by water.

Prepared in the above manner, this reagent deposits after some time a blackish powder which is easily recognized as iodide of bismuth, and may be removed by filtration.

The alkaloid precipitate does not appear to present a constant composition, it seeming to vary according to the proportion of acid present in the solution. Thus, for example, in precipitating quinia from a solution of its sulphate, if only sufficient acid be added to prevent the decomposition, a beautiful orange-red precipitate is obtained; but if there be an excess of acid, the precipitate is paler and diminished in volume.

Since, therefore, the nature of the precipitate varies, and the composition of the reagent itself also changes, M. Yvon considers it would be impossible to use the double iodide of bismuth and potas-

sium as a volumetric test; but it would be useful for the detection of alkaloids where the precautions indicated are taken.—*Pharm. Jour.* [*London*], *June* 20, 1874.

FISH OILS USED AS MEDICINE.

The *Chemist and Druggist* contains a paper, by Mr. P. L. Simmonds, on the fish oils of commerce, from which the following extract relating to those oils which are used in medicine is made:

"In Russia among the accessory products obtained from various species of fish, oil is one of the principal, amounting in value to about half a million of roubles. This oil has three different uses—for medicine, for food, and for industrial purposes. Its source or origin is also threefold, according to the part of the fish in which it is chiefly concentrated. In some species, as, for example, in the cod, it is obtained exclusively from the liver; in others, as in the 'sandre,' the fat surrounds the intestines, the rest of the body in these fish never being fat; but in the larger number of species, as the herring, the salmon, and the siluroids, it penetrates all the frame. According to these differences in the distribution of the fat in the body of the fish, as well as the use to which the oil is to be applied, the mode of extraction varies. The cod-liver oil for medicinal use is extracted from the livers cut into pieces while they are still fresh, and submitted to the action of heat in a steam bath. This method has only been introduced of late years on the coast of Lapland, on the initiation of the Minister of Works of Russia, who offered rewards to those who followed the better method pursued in Norway, to which publicity was given. The invitation was readily responded to, and from one fisherman alone the Government buys 15,000 lbs. to 20,000 lbs. of cod-liver oil for use in the hospital. The fish oil which is intended for food is obtained principally from the fat which surrounds the intestines of different species of sturgeon and the 'sandre;' these are heaped together, washed and melted by heat. This oil is added to caviare, which of itself is not considered sufficiently rich in fat, and is also used at the seat of production, in place of vegetable oil, by the workmen on fast days.

"Very good medicinal cod-liver oil is now made at St. Pierre, Newfoundland, by the French, and it forms a considerable article of commerce, its production having been encouraged by the French

Academy of Medicine, who state the brown, pale, and bleached oils made there will compete favorably with the products of the Norwegian and English factories. That made in April, May, and June is the best; the livers being then leaner; later, when they are fat, the oil is not considered so good in a therapeutic point of view.

"I have noticed the following mode suggested of making cod-liver oil palatable: Take equal parts of ground coffee and bone-black, as used by sugar refiners, mix them in ten times their combined weight of cod-liver oil, and digest for half an hour at a temperature of about 130° Fahr.; then place the mass on a filter and drain the oil off, and you will have its nauseous taste changed into a pleasant coffee flavor. If the notion is correct that coffee is an antidote of iodine, and as the latter is one of the active ingredients of cod-liver oil, it may be well to let the patient use some iodine preparation at the same time, or to add a little iodine syrup to the deodorized cod-liver oil.

"In Norway, the cod fish at the early part of the season are rich in liver, so that from 250 to 300 of the net-caught fish yield a barrel of liver, while 50 to 100 more fish taken on lines would be required. As the season advances, the fish may become perceptibly poorer, from 400 to 450 being required to fill a barrel, while on the sea-board or western side of the Lofoden Islands from 600 to 700 livers are requisite. On the whole, therefore, it may be assumed that an average number of 450 livers are required to the barrel.

"The total produce of cod-liver oil from the Norwegian fisheries in 1869 was estimated at 19,000 barrels—200 barrels were prepared as medicinal cod-liver oil. Fresh livers for medicinal oil fetched from 27s. to 31s. per barrel, old livers from 22s. to 26s. The catch of each boat varies from eight to twenty barrels of liver.

From the coast of Norway the average export of fish oil from 1851 to 1855 was 52,900 tuns, and from 1856 to 1860, 59,617 tuns per annum.

"The produce of the French cod-fishery imported in 1860—which was a fair average of the five years previous—was as follows: Cod oil, 2,050,846 kilograms; cod oil not purified, 284,649 kilograms. From St. Pierre and Miquelon about 500,000 kilograms of cod oil are shipped annually.

"In the United States a large quantity of fish oil is made from the menhaden (*Alosa menhaden*). Long Island, Connecticut and Rhode Island produced in 1870 about 1,400,000 gallons, and the business in

the State of Maine is also large. Six factories in Long Island use up every week about 2,000,000 fish. The manufactories are nearly all worked on different plans. Some use large tanks, in which the fish are placed, and into which steam is forced. A portion of the oil is extracted, and coming on the surface of the water, is skimmed off; the water is then drained away, and the refuse is pressed by hydraulic presses or powerful levers. In another mode of working used by one manufactory, the fish are placed in a large iron cylinder, similar to a boiler, and steam is let in at a given pressure, while the cylinder is made to rotate by a steam engine. The fish are steamed from twelve to fifteen minutes, then turned out, and subjected to hydraulic pressure, which, of course, extracts oil and water together. This runs through pipes into tanks, where the oil rises to the surface, and is taken off. A thousand fish yield on average about thirteen or fourteen gallons of oil, though this depends largely on the season, and the good or bad condition of the fish. The uses to which this oil is put are very numerous. It is good for table purposes, and, when properly prepared, the best kind is extensively used under the name of 'olive' oil. It is a good paint oil: (?) much of the linseed oil sold in America has a large amount of menhaden oil mixed with it. It cannot, however, be used for lubrication, owing to the rapidity with which it absorbs oxygen and 'gums.'

"From the ool-a-chan, or houlican, a small transparent fish like a smelt, the Indians of Vancouver obtain an excellent oil, which is used for the same purposes as cod-liver oil, and with as much, if not greater, benefit. The oil when cold is of the consistence of thick cream, white in color, but with little odor, and by no means unpleasant to the taste; in fact, those who use it, very quickly acquire a partiality for it. The Indians make large quantities every season, and with them it supplies the place of butter. They cannot live without it, and it forms a great article of trade. They prefer it rancid. It is a notorious fact that the Indians are subject to spitting of blood and consumption, but still live to a great age. How much has the ool-a-chan oil to do with the prolongation of their days?

"The houlican is somewhat larger than the sprat, and is so full of oil that it is said that those caught in the north will burn like a candle. The oil is obtained by merely immersing the fish in a small quantity of water and applying heat. The oil is then skimmed off,

and when properly filtered is a very pellucid oil of a delicate pale-yellow color.

"Among the fish oils, and other oils, locally obtained or met with in the East, are, at

"Madras. Karahmanoo oil, from *Polynemus plebeius* and *P. uronemus;* skate oil, serinei oil (*shark-liver*).

"Bohet fish liver oil, oil from the loggerhead turtle (*Caouna dioacea*, Esch.).

"Patna. Porpoise oil.

"Calcutta. Fish maw oil; Joree and Seephoo oil.

"In the Archipelago. Muria ekam fish oil.

"On the Western and Malabar coasts an oil is prepared which is supplied to the hospitals for the use of the troops: this, in many cases, is obtained from the liver of the skate or ray, saw fish, cat fish, seer and white shark indiscriminately. From analysis and experiments, it has been found to equal in its medicinal properties the best cod-liver oil, but from its disagreeable taste and odor it could never supersede that oil. At Kurrachee, large quantities of fish liver are prepared, but it is not so well made as at Malabar and Calicut.—*Canadian Pharm. Journ., July*, 1874.

NOTES ON THE MEDICINAL PLANTS OF THE SCROPHULARIACEÆ.

By John R. Jackson, A. L. S.

This order, which is for the most part composed of herbaceous plants, is usually considered as comparatively unimportant in an economical point of view. With us this is to some extent true, the foxglove (*Digitalis purpurea*) being the only officinal plant of the group; but in other countries many species are esteemed as valuable medicines. The family is very widely distributed; its members are most abundant in temperate regions, but some are nevertheless found in other climates. Though many of the plants are acrid and bitter, their medicinal properties vary very much, as will be seen in the following consideration of the different species. Thus, in the foxglove, which is so well known that we need not describe the plant, the effects are remarkable for their varied operation, altering the frequency of the pulse, or enfeebling the action of the heart in various degrees in different persons.

In North America many of the *Scrophulariæ* are used in medicine. *Scrophularia nodosa*, L., the figwort, a plant growing some two or three feet high, and found in woods and thickets over a good part of Europe, was at one time officinal in the Dublin Pharmacopœia, the leaves being used in the preparation of an ointment.

In some parts of Europe, as well as in America, they are occasionally used, as well as the roots, for making poultices for ulcers, tumors, burns and cutaneous eruptions. The leaves have a rank, disagreeable smell and an acrid, bitter case, and the root has also a nauseous odor. The leaves of this plant were, at one time, supposed to have tonic, diaphoretic and anthelmintic properties, and were advocated for the cure of scrofula. Farmers occasionally use a decoction of the leaves for curing scab in pigs.

The great mullein, *Verbascum Thapsus*, L., a well-known British plant, in gravelly, sandy, or chalky soils, is common also in neglected fields and along roadsides in the United States. The thick, woolly leaves have a mucilaginous, bitter taste, which is extracted by infusion in water. They are demulcent and emollient, and were at one time much valued, not only in domestic practice, but by practitioners in catarrh and diarrhœa. Sir James Smith testifies to their value in the following words: "A pint of cow's milk, with a handful of the leaves of this mullein boiled in it to half-a-pint, sweetened, strained, and taken at bed-time, is a pleasant emollient and nutritious medicine for allaying a cough or removing the pain and irritation of the piles." The leaves, steeped in hot water, are not unfrequently used by country people as poultices in hæmorrhoidal complaints. In Sweden and Norway a decoction of the leaves is given to cattle suffering from cough or pulmonary diseases. The flowers, it is said, when dried in the sun, give off a fatty substance, which is used in Alsace as a cataplasm. Porcher, in his 'Resources of the Southern Fields and Forests,' thinks that sufficient attention has not been paid to this plant as a medicine, and strongly recommends the desirability of making a careful analysis. In an enumeration of the uses to which the plant is put in North America, he states that the leaves steeped in hot water are applied externally as a feebly anodyne emollient dressing for sores, for the relief of headache and frontal pains, and are much used by the poorer classes. The leaves of this plant and the bark of the root of sassafras, in equal parts, boiled in water and concentrated, then mixed with powdered sassafras bark to form pills, are

said to be valuable in the treatment of ague; and finally he refers to a report of 'several cases in which the paroxysms of intermittent fever were completely prevented by the administration of the warm infusion of the fresh root. Four ounces of the fresh root to one pint of water, reduced one-half by boiling, of which two ounces were given every hour, commencing four hours previous to the expected chill.'"

Other species of *Verbascum* have been said to possess similar properties to the species just mentioned.

In the genus *Veronica*, which is well known in this country as including some of the prettiest of our native flowers, we find several species have been used at various times in medicine. The well-known and beautiful little plant, the germander speedwell (*Veronica chamædrys*, L.), was at one time valuable amongst the old herb-doctors as a vulnerary, and Gerarde recommends the root as a specific in pestilent fevers.

The leaves of the common speedwell (*V. officinalis*, L.) are astringent and bitter, and were, even up to a comparatively recent date, not only used as medicine in this country, but also as a substitute for tea. The plant grows in South Carolina, and, though not at present included in the United States Dispensatory as an officinal medicine, it is nevertheless, after careful examination, reported to contain "in the fresh juice and an extract from the herb, a bitter principle, soluble in alcohol, but scarcely so in ether; an acrid principle, red coloring matter, a variety of tannic acid, a crystallizable fatty acid, with malic, tartaric, citric, acetic and lactic acids; a soft, dark, green, bitter resin and mannite." The Brooklime (*V. Beccabunga*, L.), also a British species and found in moist places, was formerly valued as an antiscorbutic, the leaves and young tender stems being the parts used. In some parts the leaves are occasionally applied as a styptic to wounds, and when bruised are also applied to burns. Like the former, this species has been used in North American practice for purifying the blood.

Within the last few years, some attention has been given in America to the Virginian veronica or culversroot (*Veronica Virginica*, L.) It is a perennial plant, common in the United States in mountain valleys, and grows to a height of three or four feet. The root is the part used; it is bitter and nauseous, and imparts its active properties to boiling water. The fresh root is an active cathartic and emetic. A large teaspoonful of the root in a gill of boiling water, repeated

every three hours, is said to be an efficient purgative, operating with mildness and certainty, and peculiarly adapted to typhoid and bilious fevers.

The *Gratia Dei*, so called in olden times on account of its active medicinal properties, and known also as the hedge hyssop by the herbalists, is the *Gratiola officinalis*, L. It is a perennial herb, common in moist places in the South of Europe, where it is used in dropsy, jaundice, scrofula, chronic hepatic affections, etc. In large doses, it is poisonous. "According to Vauquelin, the purgative property depends upon a peculiar substance analogous to resin, but differing from it in being soluble in hot water. Dr. Whiting has announced the existence of veratria in it, which accounts for its active properties." Though not used in medicine in this country, it is said to have formed the chief ingredient in a once famous nostrum for gout, known as "eau médicinale." In some of the meadows of Switzerland the plant is said to be so abundant that it is dangerous to allow cattle to graze in them.

In a recent American list of "Pure Medicinal Preparations prepared *in vacuo*" at New Lebanon, occurs a preparation from *Chelone glabra*, L. The plant is known as the snake-head, or balmony, and grows in damp soils. Its action is described as follows in the catalogue above referred to: Tonic, cathartic and anthelmintic, valuable in jaundice and hepatic diseases, likewise for the removal of worms. Used as a tonic in small doses in dyspepsia, debility of the digestive organs, and during convalescence from febrile and inflammatory diseases. Fluid extract; dose, 1 drachm. Chelonin: dose, 1 to 2 grains. Amongst the medicinal plants prepared by the society known as Shakers, the foliage and twigs of *Chelone glabra* are included.

In Kumaon and other parts of India, the roots of *Picrorrhiza kurroa*, Royle, are used in medicine as a tonic and antiperiodic, and are sold in the bazaars, where they occur in short, brittle pieces, of a dark color, somewhat irregular, about the thickness of a goose-quill, but tapering towards the extremities, and covered at this part with numerous small rootlets. They have a dark-brown fracture when broken across, and an intensely bitter taste. This medicine is placed in the Indian Pharmacopœia amongst non-officinal articles, with the remark that "it would be desirable to have more information with regard to this root and its properties." Other Indian *Scrophulariaceæ* included in the Pharmacopœia, but not officinal, are, *Herpestis Monniera*,

H. B. K., and *Celsia Coromandeliana*, Vahl. The first of these is regarded by the Hindoos as a powerful diuretic and aperient; the juice of the leaves, in conjunction with petroleum, is used as a local application in rheumatism, and the juice of the leaves of the *Celsia* is said to have been given with advantage in cases of acute and chronic dysentery.

Small quantities of the flowers of *Lyperia crocea*, Eckl., have occasionally been brought into this country from the Cape of Good Hope as a dye, but have hitherto failed to attract buyers. As imported, the flowers have somewhat the appearance and smell of saffron. Dr. Pappe in his "Floræ Capensis Medicæ Prodromus," says: "This bush deserves notice as a drug, and in all probability will, ere long, become an article of colonial export. It grows abundantly in some parts of the Eastern districts, whence it has found its way into the dispensary. The flowers, which are called *Geele blosmetjes*, closely resemble saffron in smell and taste; they possess similar medical properties, and as an antispasmodic, anodyne and stimulant, ought to rank with the *Crocus sativus*. Here they have as yet been only used with success in the convulsions of children, but they deserve a more general trial. On account of the fine orange color which they impart, they are in daily request among the Mohamedans, who use them for the purpose of dyeing their handkerchiefs. This drug has been observed to be sometimes adulterated by the admixture of other plants of the same genus, which are less efficacious."

Amongst plants of lesser utility belonging to the same order, it will suffice to mention the eyebright, *Euphrasia officinalis*, a decoction or infusion of which is still occasionally used in some parts as a wash for disorders of the eye. It is astringent and slightly bitter. The yellow toad flax, *Linaria vulgaris*, is said to be purgative, and was at one time used by the herb doctors for the cure of dropsy. *L. Cymbalaria*, some species of *Antirrhinum*, *Pedicularis palustris*, and *P. sylvatica*, have all been used by herbalists, but they are not of sufficient importance to call for further remark.—*Pharm. Journ.* [*Lond.*], *June* 27, 1874.

THE CAMPHOR TRADE.

The camphor of commerce is obtained from the camphor laurel, *Camphora officinarum*, which grows in China, principally near Chinchew, in the provine of Fokien, in the Island of Formosa, and in Japan.

There is another description, which is highly prized by the Chinese for its supposed medicinal qualities, that is found in a solid state in the trees growing upon the islands of Borneo and Sumatra, and throughout the Malayan Archipelago. The Arabs were acquainted with the properties of this article, which they called kaphoor, but it does not apper to have entered into the traffic of the Romans or the Greeks. Both kinds appear to have been used by the Hindoos before the arrival of the Europeans in India, and the prices of the different sorts, reduced to present Indian weights and moneys, will be as they existed in Malabar and Calicut at the beginning of the sixteenth century. There are many plants, such as the cinnamon tree, which supply a kind of camphor; another source is the *Blumea grandis*, one of the most abundant weeds throughout the Tenessarim provinces. It grows six or eight feet high, with leaves which, when bruised, emit a strong odor of camphor. There is also an imitation in Japan, but it can be easily distinguished from the genuine. The camphor tree has been successfully cultivated in Europe, and there is mention of one at Malmaison over twenty feet high by six inches in diameter. In Spain camphor has been manufactured from several *Labiatæ*, and has been prepared artificially by passing a current of muriatic acid gas through turpentine; this variety has not, however, been used in medicine.

The camphor of commerce is derived from a shrub which much resembles the ordinary laurel in appearance, and several specimens may be seen growing at the royal gardens of Kew. It is an evergreen, and grows to a considerable size, and emits a camphoraceous odor when bruised. The leaves are shining and of a bright green. The wood which is white and fragrant, is much prized by the Chinese for carpentry work, since the scent keeps off the operations of white ants and other insects. There are several methods adopted in different countries for obtaining the crude camphor, viz., the original condition in which it is brought to Europe. These consist chiefly in separating the root, trunk and branches, which, being cut into chips, are introduced into a still with water, and heat applied, when the steam generated carries off the camphor in vapor. These vapors rise, and, passing through rice straw, with which the head of the still is filled, the camphor solidifies and is deposited round the straw in minute grains or particles, somewhat about the size of coarse sugar or sand, which by aggregation form grayish crumbling cakes, with all the properties of purified

camphor. These cakes of impure camphor are refined by being introduced into a large globular glass vessel in quantities of about 10 lbs., are reheated, when first the water rises in steam and is allowed to escape at a small aperture; and then, after this aperture is closed, the camphor sublimes and resolidifies in the interior upper part of the flask as a semi-transparent cake, leaving all impurities behind. The flasks are then cooled and broken by throwing cold water upon them, and the camphor is taken out and sent to market. The glass globes employed are called by the Italian name *bomboles*, the sublimation of camphor having been first practiced at Venice, where it was held as a monopoly, but it is now done in all the large cities of Europe. The process, which is completed in about forty-eight hours, requires considerable attention and experience. There are two kinds of unrefined or crude camphor known in commerce:—1. Dutch or Japan camphor, also called tub camphor, from the circumstance of its being brought from Batavia in tubs covered by matting, each surrounded by a second tub, secured on the outside by hoops of twisted cane. Each tub contains from 1 cwt. to 1¼ cwt. or more. It consists of pinkish grains, which by their mutual adhesion form lumps. It is of larger grain, clearer, and sublimes at a lower temperature than the second variety, which is known in commerce as, 2, ordinary crude camphor, China camphor, and Formosa camphor. This is imported from Singapore, Bombay, &c., in square chests lined with lead foil, and containing 1¼ to 1½ cwt. It is chiefly produced in the Island of Formosa, and is conveyed in junks to the Chinese ports of Shanghai and Canton, whence the foreign markets are supplied.

Of the first description, in 1870—the last year for which returns are obtainable, owing to alterations in the accounts of the British Custom House—there were imported from China 7,890 cwts.; from Japan, 2,576 cwts.; from the Straits Settlements, 1,023 cwts.; from Bombay, 311 cwts.; and from Germany, Holland and France together 568 cwts.; in all, 12,368 cwts., valued at £45,294, making an average of £3 13*s.* 3*d.* per cwt. Of the second, or better kind, the imports were:—From China, 2,171 cwts.; from the Straits Settlements, 51 cwts.; from France and Germany together, 139 cwts.; in all 2,361 cwts., valued at £14,498, making an average of £6 2*s.* 10*d.* per cwt. There is a considerable traffic carried on between the Chinese mainland ports of Shanghai, Hong Kong, and Canton with the ports

of Tamsuy and Taiwan, on the Island of Formosa, and between the Chinese ports and the ports of Japan.

The Island of Formosa is the chief place where the camphor of commerce is grown. This island is populated by the Chinese, who inhabit the fertile plains, where rice, sugar and indigo are produced, and by a mixed race of civilized aborigines and Chinese, on the lower range of hills where tea and hemp are grown; and in the higher range, amongst the mountains—one of which, called Mount Morrison, is said to be 13,000 feet in height—the camphor laurel flourishes. Here, beyond the boundary line of territory under the Chinese government, have arisen constant disputes with the savage tribes, accompanied often with fearful attrocities and destruction to the timber. The fine camphor trees thus destroyed it will take many years to replace; and as, from the peculiar character of their large, outspreading growth, they only occur at widely-scattered intervals, the time may not be distant when this chief source of profit may be reckoned as one of the things of the past. At present they are limited to the Taiwan and Tamsuy localities, the trees having long since disappeared from the mountains of the southern department accessible to the Chinese settlers. Formerly the camphor trade was a monopoly granted by the Chinese government. The camphor mandarin, as he was termed, who enjoyed this monopoly paid 60,000 dollars annually into the imperial treasury for his privilege, and having obtained the camphor at the rate of about five dollars per pical of 133⅓ lbs., he would then sell it at twenty-seven dollars. One dollar for duties and some other slight expenses increased the cost, and about ten per cent. was lost by evaporation during transit, for, with the proverbial dogged conservatism of their nation, they insisted on continuing to pack it in wood instead of stowing it in tin cases, by which contrivance it might be all saved.

The profits still remained considerable, and it is the opinion of competent judges upon the spot that, under the peculiar circumstances of the camphor manufacture and trade, a monopoly of this kind, carried out under European superintendence, might even be productive of good results. How long this system had been in existence is not known, but the earliest trade notices, which date back to the commencement of 1862, this monopoly is mentioned as a thing of some standing. At the end of 1868 free trade was proclaimed; but in spite of the promises held out, the traffic did not greatly increase. Local seizures,

intimidation, and persecution by Chinese agents, with many other obstacles placed in the way of British merchants by the native officials, almost amounted to a revival of the monopoly, the abolition of which represented an annual loss to the government of 60,000 dollars. These obstacles required to be removed to induce British merchants to embark their capital in a trade subject to such arbitrary and oppressive interruptions. At the port of Tamsuy the principal article is camphor, and perhaps the most interesting, since Tamsuy seems to be the main source from which the supply is obtained for the European market. The export of 1869 was not quite equal to that of 1868, but was much above the average of former years. The camphor trade seems always to have been carried on in the midst of various claims and disputes. In the earlier part of that year several boatloads of camphor in which English merchants were interested had been plundered in the upper part of the river. The cause of the plundering was alleged to have been some dispute among the Chinese camphor dealers themselves, but pecuniary reparation was made to the owners by the mandarins. At Taiwan, in 1870, the export was valued at £5,316, but the trade had been attended in the south of the island with such heavy losses, owing to the local action of the mandarins, that no fresh operations were commenced. In 1871, at Tamsuy, the trade had met with discouragement in consequence of the Hong Kong prices. The following figures, extracted from the Consular Reports, will best show the commerce at the two ports where the camphor is exported, and it will be observed that the trade at Taiwan has dwindled to the small value of £212, and that it is now almost entirely confined to the more northerly port of Tamsuy. The exports were as follows:

	Taiwan.		Tamsuy.	
	Piculs.	£	Cwts.	£
1868 . . .	.....	2,195	17,148	.....
1869	.....	3,393	16,425	29,330
1870 . . .	2,363	5,316	17,239	29,080
1871	.....	.....	11,537	15,048
1872 . . .	95	212	12,239	23,363

Vice-Consul Baber maintains that, even under adverse circumstances, the production of camphor succeeds in maintaining itself at about the same annual rate without much progress or retrogression. The production in the San Koying district had decreased about 200 piculs per month, owing to the frequent attacks of the aborigines on the distillers, while the production in the Tokoham region had scarcely increased. The country round Kiamchaiang had afforded an irregular supply of 200 to 300 piculs per month. The three might roughly be estimated 13,200 for the whole of the year 1872. The Customs returns show that of this amount 10,281, piculs were exported in foreign vessels. The price during the same time had ruled at rates showing a profit of two or three dollars per picul to producers. There had been a larger number of Chinese buyers visiting Tamsuy for the Hong Kong market than in former years, owing to the increased facilities for transport afforded by regular steamers. Foreign buyers, not being able to compete with these Chinese, who can live and work cheaper, had not bought so much as in former years. Several Hong Kong Chinese were anxious to obtain transit passes in preference to paying "Ckin," but none had as yet been issued to them. No attempt had been made at renewing the monopoly of former years, and the trade has lost much of the danger which once existed in its pursuit.

The Japanese camphor is produced chiefly in the districts of Tosa, Satsuma and Bungo, and the principal exports are from the ports of Hiogo and Osaka. At Nagasaki, in 1869, a considerable decrease had taken place, in consequence of its having been sent to Hiogo on trial, rather than from any falling off in the production. Only 597 piculs were exported, showing a decrease of 3,974 piculs compared with 1868. The prices ranged from 18 to 23 dollars. In 1870 only 13 piculs were exported from Kanagawa, and from Hiogo the quantity was 15,770 tubs, valued at 220,780 dollars. At Nagasaki the camphor had declined in price the average during the year being $15.25 per picul. This was attributed to the large quantities of Formosa camphor which, since the removal of the restrictions upon its export, had been brought into competition with the Japanese camphor. In the year 1871 the value of camphor exported from Japan amounted to 138,575 dollars, and the following will show also the value and places of export in 1872:

	1871.	1872.
	Dols.	Dols.
Kanagawa	.....	1,441
Hiogo and Osaka	.....	132,743
Nagasaki	.....	18,695
Total	138,575	152,879

Some camphor was sent to England, but the exports were small, in consequence of the high freights, whilst most of the produce of the country, owing to the superiority of the vessels, goes to the Chinese port of Shanghai.—*Chemist and Druggist, June.*

AMERICAN PHARMACEUTICAL ASSOCIATION.

NOTICE OF ANNUAL MEETING.

The Twenty-second Annual Meeting of the American Pharmaceutical Association will convene in the city of Louisville, Kentucky, on the second Tuesday (8th) of September, 1874. The first session will open at 3 P. M.

Those desiring information concerning the meeting, or on business pertaining thereto, should address the permanent Secretary, Prof. John M Maisch, 145 North Tenth street, Philadelphia, Pa.

The Local Secretary, Prof. Emil Scheffer, of Louisville, will render the necessary assistance in connection with the exhibition or other local arrangements. The officers of the Association will, as far as possible, provide every convenience for those desiring to participate in the deliberations; also to those who exhibit articles of pharmaceutical interest. In order that the meeting may be a success, I would urge each member to give all possible assistance in furthering the objects of the Association

It is unnecessary, at this time, to explain its objects or the good already achieved; these are facts well known to all who are practically or scientifically interested in the promotion of Pharmacy. Those who are not so informed I would refer to its Constitution and Annual Proceedings. From a bright star of the pharmaceutical firmament in 1852, the Association has grown to an effulgent sun of intellectual light, its diverging rays, with increasing splendor, permeating every part of this vast country. The various standing committees, representing every phase of interest connected with the trade and profession of pharmacy, will bring farward a valuable store of well-digested information; whilst the exhibition department, so attractive in the past, promises to be unusually large and interesting this year. The many advantages accruing to members, especially those who attend the annual gatherings, the proceedings of which are published in book form, being faithfully recorded facts in the progress of pharmacy and its allied sciences, are essential to every well regulated pharmaceutical library, and in money value being more than equal to the annual dues, should induce every pharmacist and druggist who feels a pride in his vocation, to apply for membership. Copies of the Constitution, by-laws and blank applications for membership will be furnished, by Prof. Maisch, to those who apply for them.

The experiment of electing where the annual meetings shall be held, regardless

of invitations from local organizations, to judge by the results of the last two meetings, is a success, and promises greater usefulness to the Association in the future, by relieving local members from any obligation to give unnecessary attention to visiting members. The good influence of last year's meeting in the South; the large increase of Southern members; the very hospitable manner in which the Association was received and entertained by the pharmacists, druggists and municipal authorities of Richmond; the subsequent organization of the Richmond Pharmaceutical Association, which, doubtless, to some extent, was influenced by this Association, are pleasant remembrances to those who were fortunate enough to be present.

I sincerely hope that equally good results may attend the meeting this year in the Southwest.

All who are interested in the advancement of pharmacy are hereby invited to attend, and to place on exhibition any article of interest relating to the objects of the meeting. In short, the meetings are pleasant and profitable to the overworked pharmacists, socially and intellectually, while they promote the general health, and extend professional and business enterprise.

JOHN F. HANCOCK, *President.*

Baltimore, July, 1874.

Minutes of the Philadelphia College of Pharmacy.

PHILADELPHIA, Sixth month 29, 1874.

A stated meeting of the Philadelphia College of Pharmacy was held this afternoon in the College Hall. Fourteen members present. Dillwyn Parrish, President, in the chair.

The minutes of the annual meeting in March last were read and adopted.

The minutes of the Board of Trustees were also read by Thos. S. Wiegand, in the absence of William C. Bakes, Secretary of the Board. By these minutes we are informed that the titles to the houses recently purchased on Tenth street, have been passed, and the College is now in full possession of the properties.

The donation of Peter Williamson, referred to the Board, has been designated the "Peter Williamson Scholarship Fund," and the interest accruing from it was directed to be applied annually to the education in the College of such persons as the Board shall select.

The laudable example thus set by the generosity of one of the founders of the College has been favorably spoken of by many of the members, and the hope has been expressed that others interested in the institution may see their way clear to do likewise.

This being the time for an election of delegates to attend the meeting of the American Pharmaceutical Association, to be held in Louisville, in September next, a ballot was ordered. William B. Webb and Samuel S. Bunting, acting as tellers, reported the following gentlemen elected: James T. Shinn, Prof. Jos. P. Remington, Alonzo Robbins, Jos. L. Lemberger, Edward C. Jones. At the same time an election for delegates to attend the Convention of teaching Colleges of Pharmacy, resulted in the choice of James T. Shinn, Prof. John M. Maisch, Prof. Jos. P. Remington.

On motion it was resolved, that each of the above delegations be authorized to fill any vacancies that may occur in their respective bodies.

A resolution offered by William B. Webb, that the Treasurer be authorized to collect the interest on the loans of the city of Philadelphia due the College, was unanimously adopted.

Then on motion adjourned.

WILLIAM J. JENKS, *Secretary.*

Pharmaceutical Colleges and Associations.

PHILADELPHIA COLLEGE OF PHARMACY.—The following document explains itself:

To the Board of Trustees of Philadelphia College of Pharmacy.

Your Committee to whom was referred the subject of granting the title of "Doctor in Pharmacy" to the graduates of this College, respectfully report:

That they have reviewed the discussion of this subject at the convention of the Teaching Colleges of Pharmacy, held in Richmond, Va., in September, 1873, as also the answer of the National College of Pharmacy of Washington, D. C., to the resolution adopted by the said convention (requesting the "National College," to reconsider its determination to grant the above-mentioned title).

Your Committee are unanimous in the opinion that, however expedient a change in the title conferred by this College upon its graduates may become, by reason of the advancement of Pharmaceutical Science, they see cause to deprecate the adoption of the title of "Doctor."

First.—On account of the branches of Pharmacy and practice of medicine being so closely connected with each other, that the title would tend to confusion. A pharmacist engaged in dispensing medicines with the title of "Doctor" would naturally impress the public with the idea that his "title" authorized him to *prescribe* as well as *dispense*. And notwithstanding all argument to the effect of *educating the public* to an understanding of the title, many would constantly apply to the Pharmaceutical Doctor when the *experienced practitioner* in medicine was really the person whose services they desired and required.

Second.—It should be the aim of all Colleges of Pharmacy to *guard* the public in the important matter of "remedies," against the evils attendant upon ignorance and presumption without qualification; to this end we should exercise great caution not to confound the kindred professions of Pharmacy and Medicine, and so lay ourselves open to the charge of *promoting* empiricism by granting a title which *could be used* by persons lax in moral responsibility and professional ethics, to the detriment of the public, in the important matters of health and disease.

Your Committee are impressed with the view that our time-honored title of "Graduate in Pharmacy" should be adhered to, as the primary honor conferred upon the recipient of the Diploma of this College. Much might be said on both sides of an argument in regard to the lexicographic terms "Graduate" and "Doctor." Into this discussion we do not propose entering. It has been the aim of this College so to instruct its pupils that they could practice their profession with safety to the public and with honor to themselves, and when the academic honor of the Diploma of the College is granted, it expresses the *simple fact* that the recipient has graduated or *taken a degree* or rank in the branches in which he has been instructed.

If by industry, study, and the cultivation of habits of close observation, or by reason of peculiar aptitude for any of the branches of natural science, a

graduate should distinguish himself in after life, *then*, in the opinion of your Committee, is the proper time for the College to recognize his services by conferring *another degree*.

Your Committee therefore recommend:

First.—That the title of "Graduate in Pharmacy" be adhered to on granting the Diploma of the College.

Second.—That a graduate of five years' standing, engaged in the practice of Pharmacy, on presenting to the College an original dissertation of *sufficient value*, on any of the branches taught in this College, may have conferred upon him the title of ——— ———.

Third.—A graduate of this College, recognized by the Pharmaceutical Profession as an original investigator in any of the branches of the profession, or as an authority by reason of superiority in some branch of science, may have conferred upon him the title of ——— ———.

DILLWYN PARRISH,
ROBERT BRIDGES,
JOHN M. MAISCH,
JOSEPH P. REMINGTON,
ALFRED B. TAYLOR,
CHARLES BULLOCK,
} *Committee.*

The Board of Trustees has approved the tenets in the above report, and, after a lengthy discussion, filled the first blank by *Master in Pharmacy*, thus constituting this the second title; while the consideration of the third title has been postponed to a future meeting.

By request of the Board of Trustees the following paper is now printed. It was read at the College meeting, September, 1864, and then referred for publication (See *Amer. Journ. Pharm.*, 1864, p. 538), but was mislaid. Notwithstanding ten years have elapsed since, its interest has not diminished, but rather increased, in consequence of the many improvements and progress during this time. We feel assured that our readers will be edified by the perusal of these reminiscences of one of our oldest druggists and earliest College members. The paper is printed exactly as it was read:

College Hall on Zane Street.

Read at the Semi-Annual Meeting of the Philadelphia College of Pharmacy, held 9th month, 1864.

To give you some idea of pharmacy in Philadelphia, before the establishment of this College, my brother Henry served his apprenticeship, during the war of 1812, with one of the most respectable retailers of the city, and has related to me the fact of his having to sift Glauber salts to make Epsom, and sift carbonate magnesia to get calcined magnesia.

Epsom salts was very little used when I was an apprentice; we used to purchase from twenty to forty pounds of Glauber at a time, at 2¼ cents per pound, while we would only buy a single keg of Epsom, holding about 25 pounds, at 15 cents. The first really nice Epsom salts I recollect having in our store, was the year the College was organized; John Farr, the noted chemist, was going to pay a visit to his friends in London, and offered to make some purchases for us, and one of the articles in that first importation of our house was, two casks, 1,190 pounds of beautiful Epsom salts, at a cost here of 7 cents per pound, which was so much in demand by the retailers that we increased our orders, until the Baltimore manufacturers put a stop to our importations of the article. Super. carb. soda, which has been such a common and uni-

versally used article of latter years, was hardly ever seen when I was learning the business; I think the first we had in our store, was purchased from Farr & Kunzie at $1.25 per pound, in 1821, when we paid them the same price for tartaric acid.

I attended the first and second courses of lectures of this Institution, and should have applied for the diploma had there been any such prize to have been obtained, but the College did not even decide upon the form of a diploma, until I had been in business for myself between three and four years.

Forty years ago, all the calcined magnesia we sold was burned in Abram Miller's pottery, opposite this building, where the public school now stands; we used to take a case of English carb. magnesia, pick out some of the nicest and hardest lumps, and pack the balance in earthen crocks procured from the pottery, and send them round to be put in the kiln when Miller burned his ware.

Philadelphia, 9th month, 1864. SAMUEL F. TROTH.

New York College of Pharmacy.—The Board of Pharmacy appointed by this College consists at present of the following members: Wm. Neergaard, M.D. President; Theobald Frohwein, Secretary; Paul Balluf, Benj. E. Hays, M.D., and W. DeF. Day, M.D. We have been favored with a copy of the second annual statistical report of this Board, up to June 21st, 1874, from which we make the following extracts: At six examination meetings, extending over eighteen days, the Board examined 104 candidates, of whom 71 passed and 33 failed; 82 candidates were examined for the first, 11 for the second, 2 for the the third, and 1 for the fourth time. 19 candidates were proprietors, 3 of whom failed; while of the 85 assistants 22 failed to pass. The total number examined since the organization of the board is 279, and the total rejected 63. Of the proprietors, passing the examination, 7 were natives of the United States, 4 each of Germany and Ireland, and 1 of England. Of the assistants 38 came from the United States, 9 from Germany, 6 from England, 2 each from Canada and Ireland, 3 from Russia, and 1 each from Scotland, France, Poland, Norway, Cuba and Costa Rica.

During the past year 62 proprietors and 101 assistants were registered, making the total registrations 517 proprietors and 546 assistants. The proprietors registered were born in the United States 24, Germany 19, England 4, Ireland 9, Canada 3, and 1 each in Austria, Russia and Cuba; they presented the following certificates of competency: from the Board of Pharmacy 26, from Colleges of Pharmacy 2, from Medical Colleges 14, from Commissioners of Pharmacy 13, from foreign examining boards 6, and 1 from a German university. Of the assistants 37 were born in the United States, 32 in Germany, 8 in England, 5 in Ireland, 3 in Canada, 4 in France, 3 in Russia and Poland, 2 each in Scotland, Austria and Sweden, and 1 each in Norway, Cuba and Costa Rica; their credentials came from the Board of Pharmacy 48, from Colleges of Pharmacy 17, from Medical Colleges 4, from Commissioners of Pharmacy 4, from foreign examining boards 23, from German universities 3, and from French Schools of Pharmacy 2.

The receipts of the Board during the year amounted to $635, the expenses to $403.76, leaving a surplus of $231.24.

Maryland College of Pharmacy.—A regular meeting was held July 9th, 3½ P. M., President Hancock in the chair. The Treasurer's report for the six months ending June 30th evidenced a healthy financial condition of the College. Mr. L. Dursse, of Grafton, West Va, exhibited a new glass percolator designed to prevent loss of menstruum during use, for which he has letters-patent. The President read his annual address, which was referred, with accompanying suggestions, to the Board of Trustees; at its conclusion the College proceeded to the election of officers, which resulted in the re-election of the present incumbents, to wit, Jno. F. Hancock, President; Dr. Edward Eareckson, Secretary; J. Brown Baxley, Treasurer; and L. Dohme, Board of Examiners, The following members were elected delegates to the twenty-second annual meeting A. P. A. Prof. J. Faris Moore, Chairman, Jno. F. Hancock, Louis Dohme, F. Hassencamp and J. Newport Potts. The alternates were Messrs. Jennings, Roberts, Sharp, Webb and Monsarat. Messrs. Moore, Dohme and Roberts were delegated to represent this College in the Convention of Teaching Colleges. On motion adjourned.

J. NEWPORT POTTS, *Reporter.*

Pharmaceutical Associations in Indiana.—In Indianapolis a preliminary meeting was held July 21st, with the view of forming a local pharmaceutical society. Mr. Eli Lilly was appointed Chairman and Mr. Chas. Dennis, Secretary. A committee, consisting of Messrs. Jos. R. Perry, H. B. Cole and Ernest Krauth, to which the chairman was added as an advisory member, was chosen to prepare a constitution and by-laws to be submitted to the meeting.

We learn that it is also contemplated to organize a Pharmaceutical Association at Logansport, Ind.

The Pharmaceutical Society of Paris met June 3d, Vice-president Planchon in the chair. Dr. De Vry read a note on the new alkaloid quinamina,* and presented a specimen of it which had been prepared from a red cinchona bark from the Rungbee plantations, which are situated in Sikkim at the foot of the Himalaya mountains. The following process was employed: The mixed alkaloids were converted into neutral sulphates, and their aqueous solution mixed with a solution of Rochelle salt, whereby quinia and cinchonia are precipitated as sparingly soluble tartrates; the filtrate was treated with caustic soda and ether; the residue from the evaporation of the ether, consisting of quinamina and the amorphous cinchona alkaloid, was converted into neutral acetates, and these dissolved in a rather large quantity of water, from which sulphocyanide of potassium precipitated the amorphous alkaloid, and caustic soda, from the filtrate, the new alkaloid.

Dr. De Vry also read a note on the occurrence of ammonia in normal urine, which was proven by him about 25 years ago; the urine is rendered slightly alkaline by the addition of bicarbonate of sodium, and the filtrate treated with some sulphate of magnesium, avoiding excess, when ammonio-phos-

*See American Journal of Pharmacy, 1872, p. 302.

phate of magnesium will be precipitated; this, on being dissolved in nitric acid, yields the characteristic yellow precipitate with phospho-molybdic acid.

After the reading of a note by Dr. De Vry, on *Cinchona Hasskarliana* of Java, M. Planchon stated that of the same species individuals are found with long pistils and short stamens, and others with long stamens and short pistils.

M. Roucher stated that he has succeeded in converting crystallized digitalin into a globular condition, but as yet has not been able to transform this into crystals.

M. Mayet made rome remarks on the plan adopted for the International Pharmacopœia, the preparation of which had been referred to the Paris Society by the International Pharmaceutical Congress of 1867. M. Boudet gave a review of the labor performed by the Committee appointed for that purpose. The work will be laid before this Society in July, and discussed before it is presented to the International Pharmaceutical Congress in St. Petersburg in August.

Editorial Department.

The Twenty-Second Annual Meeting of the American Pharmaceutical Association will open on the eighth of September next, in the city of Louisville, Ky., as will be seen from the announcement by President J. F. Hancock, published on page 389. The Local Secretary has secured excellent accommodations for the meeting, as well as for the exhibition, both of which will be held in Liederkranz Hall; in order to perfect all the preliminary arrangements, all having objects of interest to exhibit are requested to inform, without delay, the Local Secretary, Prof. E. Scheffer, stating amount of space desired. We understand that the applications for space have already been quite numerous, the large industrial exposition, which will be held at Louisville, during the month of September, affording exhibitors the opportunity of displaying their goods in two places; we have also been informed that the license law in the city of Louisville has been abolished, so that every agent or firm from another place can sell there by samples, and exhibitors desiring to dispose of their goods or to sell by samples will meet with nothing antagonistic in their way.

The expected influx of strangers into Louisville, during the Industrial Exposition in September, is such that only the Galt House has agreed to accommodate *all* the expected visiting members and ladies, and, accordingly, this hotel has been selected as the headquarters of the Association. The Louisville Hotel can likewise accommodate a number of members. The hotel charges will be $4.00 a day at the Galt House and $3.50 at the Louisville Hotel.

The convention of the General Passenger Agents of the grand trunk lines of railways running east and west, which was recently held in New York, has delayed negotiations for the contemplated excursion trip to Louisville, and resulted in the refusal of all the through lines to make any reduction of fare. The Eastern members will therefore be obliged to pay full fare both ways, and

may select such routes as are most convenient for them. After a good deal of correspondence between members, the following trip, by way of the Baltimore and Ohio railroad, is proposed: The members will leave Baltimore on Saturday, September 5th, at 6.30 A. M., and stop at Grafton or Parkersburg, there to spend Sunday, and the journey to be resumed on Monday morning, so that the party will arrive at Cincinnati on Monday afternoon at 4.40 o'clock. By this arrangement an opportunity will beafforded of viewing by daylight every portion of the highly interesting and romantic scenery along the entire route. The Secretary has been in correspondence with the hotels, and ample and satisfactory accommodations for the party will be obtained. It is likewise proposed that a parlor car be chartered for the entire trip from Baltimore to Louisville, which can be accomplished at a moderate cost to each member, if a sufficient number will indicate their willingness to join; members intending to participate are therefore requested to notify the Secretary *before* September 1st. Those members who cannot conveniently start with this party from Baltimore can join it by leaving the latter city on Sunday morning, arriving at Parkersburg the same evening at 10 o'clock.

A reduction of fare has been secured by the Local Secretary for the Western members, upon the following conditions:

The Louisville, New Albany and Chicago Railway Co. will sell full fare tickets to our members, which will entitle the holder to return free, when endorsed by the Secretary of the Association; tickets are valid for the year.

The Ohio and Mississippi, and Jeffersonville, Madison and Indianapolis Railroad Co. did not make any special arrangements for our Association, they give out excursion tickets for the Louisville Industrial Exposition at half fare, which tickets hold good for four days, but no trouble at all is connected with having the tickets prolonged.

The Louisville and Great Southern Railroad Line and the Louisville and Nashville Railroad, with their branch roads, will give out excursion tickets only when five persons from one place apply at the same time for such. The return coupons of such excursion ticket will have on its back a blank for certificate of the Secretary that the holder was in attendance at our meeting. Their agents at Memphis, Nashville, Clarkville, Atlanta and Bowling Green have been instructed to sell excursion tickets upon the conditions named.

An excursion of the members and their ladies to the Mammoth Cave has been proposed; those intending to participate are invited to report on their arrival to the Secretary, so that a reduction of the expenses of each member for this special trip may be effected.

The next meeting it is to be expected will, among other results, show a large accession of new members, particularly from Kentucky and the neighboring States, and the attendance of new and old members, it is to be hoped, will be at least as large as it has been at the preceding three or four annual meetings.

THE USE OF PHARMACEUTICAL TITLES.—A man may feel a just pride in anything which has been honestly earned by him; the manner in which he exhibits

his earnings depends altogether upon his individuality and mental culture. The fop, whether rich or poor, will load himself with trinkets of precious metals and stones, or with base imitations of both, in proportion as his purse will afford it, while the truly cultivated will avoid all ostentatious display of dress and decorations, and when wearing ornaments, will select such as are simple, and merely fulfil the objects for which they are used. This broad distinction may likewise be observed in the use of titles, whether earned, begged or purchased; it will be mainly the literary or scientific fop who parades his titles on all suitable or unsuitable occasions.

The title of doctor is continually used in all civilized countries in connection with the members of the medical profession, because they are presumed to continually exercise their functions, in conformity with the duties assumed when obtaining their degree of M. D. The most successful practitioners of medicine, the brightest physicians use this title, undeterred by the fact that many a knave and fop is likewise using it.

It has heretofore, not been customary in this country to use any earned pharmaceutical title. Fifty years ago there was but one College of Pharmacy in the United States, and it was not until 1826, that the title of *Graduate in Pharmacy* was conferred for the first time. It was then not used by those entitled to it, because *then*, from the small number of graduates, the use of the title might have been regarded, as a claim to superiority, which to attest was not the design of the College. During the last thirty years, the propriety of using the title G. P., has been repeatedly suggested and discussed, and it was abandoned for similar reasons. Has the time *now* arrived? We believe such to be the case, for the following reasons:

The number of living graduates is very considerable; Colleges of Pharmacy are now located in different sections of the country; by far the largest number of these Colleges appear to work harmoniously and honestly in the same direction for the elevation of the profession; the attending classes are large, and the number of graduates receiving their diplomas, is at present much larger than the total attendance at all the Colleges not many years ago. With the increase of the opportunities of learning and the perfection of the means of instruction, the number of students has been steadily on the increase, and there are comparatively few young men now learning the business, who cannot make it convenient to attend a College of Pharmacy if they earnestly desire it and labor to accomplish it. The title of G. P., honestly earned, simply indicates that its recipient has attained such a rank, that he is regarded to be competent to practice his profession. We cannot therefore conceive of any reason why this title ought not to be used henceforth by all those who have really earned it. The manner in which it will be used, and the display which will be made with it on suitable or unsuitable occasions, will, to a considerable extent, indicate the mental calibre of its wearer.

These remarks have been suggested by a paper by Mr. Hor. N. Fraser, and by an editorial on "Pharmacal Titles" both of which have appeared in the *Chicago Pharmacist* of July, and express themselves in opposition to the use of G. P. Both writers being graduates in pharmacy, their opposition is the

more weighty. On perusing the two papers, however, we fail to discover any other tangible reason except the abuse that may arise from it, either through the use of G. P. by persons not really authorized to it, or through the lowering of the standard of graduation and the establishment of "grist mills," conferring titles to the best bidders.

We have very little fear of the evil consequences hinted at, as long as the Colleges of Pharmacy and the Pharmaceutical Associations remain true to their objects, and do not hesitate to express their disapproval at any attempt of avoidance of obligations, lowering of standard or arrogant assumption.

In the April number of the *American Journal of Pharmacy* for 1871, which closed the editorial labors of the late Professor Procter, he has, by invitation, publicly expressed his views on pharmaceutical titles, stating that it is desirable to avoid the adoption and use of any titles, for common use by pharmacists, that *will conflict with those of the medical profession.* In suggesting to the the American pharmacists the careful perusal of this paper, we feel assured that they will find in it much food for reflection upon titles adapted to pharmacists, and likewise upon their proper use. In the main, we believe that the views expressed here, will coincide with those entertained by our predecessor in the editorial chair.

Responsibility for Mistakes made in Drug Stores.—In the month of April last a sensational item was published by the daily papers stating that a wholesale drug house in Boston had been fined in damages to the amount of $15,000 for having sold to an apothecary in Fall River a package of ground aconite, which had been erroneously marked "picra;" one ounce of this aconite having been sold as picra by a clerk of the apothecary to a lady, whose life was endangered thereby. This statement appeared to be so extremely absurd that we have been at some pains to get at the merits of the case, and now lay the information, as obtained by us from different sources, before our readers, premising that we have been unable to obtain a record of the entire evidence, or the rulings and charges of the court.

It appears that Mr. Henry G. Webster, of Fall River, sent a lengthy order for drugs to Messrs. Weeks & Potter, of Boston; 2 ℔ of ground aconite root was on the first part, and 2 ℔ of picra on the last part of the order. It is claimed that the articles were put up in the order in which they were written down, and that the appointments and general management of the store are such as to render it next to impossible that a mistake in labelling could have occurred, under the circumstances mentioned.

At a time when Mr. Webster's store was temperarily in charge of his clerk, Arthur H. Brown, who had previously served an apprenticeship of about two years in different places, Mrs. Black sent for one ounce of picra, and Mr. Brown opened a bundle at the end to shake out the required quantity. The customer objected that the article did not look like picra and was answered by the clerk that it was all right; it was picra root. Mrs. Black steeped the coarse powder in a pint of gin for about twelve hours, and then took two teaspoonfuls of the liquor, when she at once discovered, from the taste, that the article was not picra, and sent for her physician, who promptly relieved her, so that in a few days she was as well as usual. Mrs. Black then brought suit for damages against the wholesale house, the principal witness being the clerk. The defence, it appears, rested mainly upon the management of the wholesale store and upon the theory that the clerk, after discovering his mistake, exchanged the wrappers of the two bundles. The verdict was for $1500 (not $15,000) damages.

Assuming, for the sake of argument, that the mistake in labelling the bundle

had been made in Boston, this case is one of peculiar interest not only to the profession, but likewise to the public. Messrs. Weeks & Potter, not having sold anything, either directly or by their agents or employees, to Mrs. Black, we fail to see upon what legal or equitable grounds the former could be held responsible to the latter for damages; if they were liable in damages, they could have been so only to the one to whom the damage had been done, namely, to Mr. Webster. The latter having received the wrongly labelled package of ground aconite root, was bound to exercise the ordinary care of examining the articles to satisfy himself of their being correct; omitting this precaution, assuming the contents to be correct, and not acting as the agent of the wholesale house, he naturally assumed, for himself and his agents, towards his customers whatever responsibility might be connected with the disposal of the goods. The ground aconite root bears no resemblance to the powdered picra, the former will not pass through a sieve finer than No. 8, and is easily recognized (in the sample submitted to us) as a root, and by a little investigation even as aconite root; picra, as is well-known, is a fine powder, differing also in color and taste very strikingly from the former. Without requiring a chemical examination, the physical properties of both are such that no apothecary of ordinary attainments and experience can possibly mistake the one for the other, and that the error assumed to have been committed in Boston, should have at once been detected in Fall River, in fact, the difference was such that even the suspicions of the customer were aroused, and were allayed only by the assurance on the part of the clerk that the article was picra *root*. The latter displayed in this transaction a surprising degree of want of information for one who had been at the business for about two years. Had Mr. Webster been present, the supposed erroneous labelling would doubtless have been at once detected and corrected but this not being the case, can Messrs. Weeks & Potter be held responsible for the employment by Mr. Webster of an incompetent clerk, or—if the latter's incompetency was known to him—for permitting him to take upon himself responsibilities for which he was not qualified?

The extraordinary feature of this case appears to us to be the accountability of a firm for no act of their own or of their agents, because *they* would have readily corrected the supposed error in labelling. All apothecaries, the entire drug trade and the public at large are deeply interested in the question: To whom does the responsibility of such a sale really attach? And we shall be glad if it be answered by the decision of a higher tribunal, to which, we have understood, an appeal has been taken. There is no doubt in our minds where the responsibility morally belongs.

Instructor of Pharmacy and Materia Medica in Harvard University.—Prof. G. F. H. Markoe has been recently appointed to this position in the medical department of the Harvard University, and we are pleased to notice this step in advance of other institutions, and the selection for the position of the gentleman, who is actively engaged in the pharmaceutical business and, though not an M. D., qualified for his new duties.

A Serious Explosion occurred on July 3d, last, at the laboratory of Allaire, Woodward & Co., Peoria, Ill., severely injuring Mr. H. A. Wetzel, one of the clerks, while powdering chlorate of potassium for the purpose of making some fire works. The newspaper accounts which we have received are not quite clear, but some precaution must have been omitted, the explosion occuring during the trituration. The attention of those occasionally engaged in the manufacture of fire-works is directed to the process for powdering chlorates, published on page 360 of the present number.

Centennial of Chemistry.—A reunion of American chemists will take place July 31st, at Northumberland, Pa., where Priestley, the discoverer of

oxygen, lies entombed. The memorial exercises will include an address by Professor Jos. Henry; a sketch of the life and labors of Jos. Priestly, by Professor Henry H. Croft; a review of the century's progress in theoretical chemistry, by Professor T. Sterry Hunt; a similar review of industrial chemistry, by Professor J. Lawrence Smith, and an essay on American contributions to chemistry, by Professor Benj. Silliman.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Treatise on Food and Dietetics, Physiologically and Therapeutically Considered. By F. W. Pavy, M. D., F. R. S. Philadelphia: Henry C. Lea, 1874. 8vo, pp. 574.

No modern treatise on this subject having existed in the English language, Dr. Pavy's work supplies a want which has been very seriously felt, and in a manner which shows that the author is an extensive reader and has judiciously arranged the numerous facts and theories, together with the most striking experiments and the deductions drawn therefrom.

The introductory portion treats of the dynamic relations of food, its origination and its constituent elements. The following chapter is devoted to the classification, chemical relations, digestion, assimilation and physiological uses of food, which term is used as "comprising that which contributes to the growth and nutrition of the body, and, by oxidation, to force-production;" the separation of the ingesta into "food" and "drink" is therefore not recognized. The author is also opposed to Liebig's classification of food into "plastic elements of nutrition" and "elements of respiration," and shows how the former may be appropriated to heat production—and some, at least, of the latter class to the formation of tissue. Food is divided into two—the organic and inorganic divisions—and the former again into nitrogenous and non-nitrogenous principles, the latter forming two groups—the fats and carbohydrates—which with the nitrogenous principles and inorganic materials, constitute four groups, into which all alimentary principles are arranged. The general relations and uses of each group are fully considered; of particular interest appear to us the relation of nitrogenous food and of fat to the production of muscular force and of heat, the metamorphosis and utilization of food of the various groups, the dietetic value of alcohol, &c., the different views and disputed theories being in all cases judiciously arranged and lucidly explained.

The following chapters are devoted to the consideration of all alimentary substances in common use, to the preservation of food, the principles of dietetics, practical dietetics and therapeutic dietetics.

It will be seen from the foregoing that the work may be "instructive and useful" to the educated, but more particular to the medical practitioner; and when the author, in the preface, expresses the hope that his task "may not be deemed superfluous," it seems to us that he has truly conferred a great benefit upon all interested in the subject matter of his work, and that nobody will study its pages without having derived valuable instruction therefrom, and without considering it not only useful, but next to indispensable.

Medical Literature of Kentucky. By Lunsford P. Landell, M.D. Louisville: John P. Morton & Co., Printers. 1874. 8vo, pp. 52.

This interesting essay, which was read before the Kentucky State Medical Society, gives biographical sketches and reviews of the writings of the medical practitioners of Kentucky, commencing just previous to the beginning of the present century, and arranging the authors in the order of their appearance. An account of the origin of the medical schools of Kentucky is likewise given.